

Fabbrica della Conoscenza

Carmine Gambardella

XI Forum Internazionale di Studi



Le Vie dei.
Mercanti



HERITAGE
ARCHITECTURE
LANDESIGN

focus on
CONSERVATION
REGENERATION
INNOVATION

Fabbrica della Conoscenza numero 39
Collana fondata e diretta da Carmine Gambardella

Fabbrica della Conoscenza

Collana fondata e diretta da **Carmine Gambardella**

Scientific Committee:

Federico Casalegno

Professor,
Massachusetts Institute of Technology, Boston, USA.

Massimo Giovannini

Professor and Rector,
University "Mediterranea" of Reggio Calabria, Italy.

Diana M. Greenlee

Professor, University of Monroe Louisiana, USA.

Bernard Haumont

Professor,
Ecole Nationale Supérieure d'Architecture Paris Val de Seine, France.

James Kushner

Fulbright Visiting Professor
Southwestern Law School, Los Angeles.

Maria Grazia Queti

Ph.D., Executive Director,
The U.S.- Italy Fulbright Commission.

Elena Shlienkov

Professor and Director of the Design Department,
Togliatti State University, Russia.

Editorial Committee:

Pasquale Argenziano

Alessandra Avella

Antonio Calderone

Fabio Converti

Nicola Pisacane

Manuela Piscitelli

HERITAGE ARCHITECTURE LANDESIGN

focus on **CONSERVATION REGENERATION INNOVATION**

Le vie dei Mercanti _ XI Forum Internazionale di Studi

Carmine GAMBARDELLA



La scuola di Pitagora editrice

Carmine Gambardella (a cura di)
HERITAGE ARCHITECTURE LANDESIGN
focus on CONSERVATION REGENERATION INNOVATION
Le vie dei Mercanti
XI Forum Internazionale di Studi

editing:
Caterina Cristina Fiorentino
Manuela Piscitelli

© copyright 2013 **La scuola di Pitagora editrice**
Via Monte di Dio, 54
80132 Napoli
Telefono e Fax +39 081 7646814

È assolutamente vietata la riproduzione totale o parziale di questa pubblicazione, così come la sua trasmissione sotto qualsiasi forma e con qualunque mezzo, anche attraverso fotocopie, senza l'autorizzazione scritta dell'editore.

www.scuoladipitagora.it
info@scuoladipitagora.it

ISBN 978-88-6542-290-8

Finito di stampare nel mese di maggio 2013

Heritage Architecture Landesign
focus on Conservation Regeneration Innovation
Le vie dei Mercanti
XI Forum Internazionale di Studi

Aversa | Capri
June 13th- 15th, 2013

Conference topics:

Heritage

Tangible and intangible dimensions,
Heritage management,
History,
Culture,
Collective identity,
Memory,
Archaeology,
Cultural landscapes.

Architecture

Survey,
Imaging,
3D modeling,
Techniques for analysis, diagnostics and monitoring,
Preservation,
Restoration,
Conservation,
Architecture Design,
Technologies,
Building materials.

LanDesign

Landscape design,
Sustainable design,
Environmental design,
Eco design,
Low-cost design,
Design for all.

Le vie dei Mercanti _ XI Forum Internazionale di Studi

Aversa | Capri
June 13th- 15th, 2013

General Chair:

Carmine Gambardella

Professor and Director, Department of Architecture and Industrial Design "Luigi Vanvitelli",
Second University of Naples – President of BENECON SCaRL

International Scientific Committee:

Ahmed Abu Al Haija

Professor and Head, Environmental Design, Urban and Architectural
Heritage, Faculty of Engineering, Philadelphia University, Jordan

Pilar Garcia Almirall

Professor, UPC Ecole Tecnica Superior d'Arquitectura, Barcelona, Spain

Harun Batirbaygil

Professor and Head, Department of Architectural, Okan University, Istanbul, Turkey

Federico Casalegno

Professor, Massachusetts Institute of Technology, Boston, USA

Joaquín Díaz

Dean and Professor, Technische Hochschule Mittelhessen-University of
Applied Sciences, Department of Architecture and Civil Engineering

Carmine Gambardella

Professor and Director, Department of Architecture and Industrial Design "Luigi Vanvitelli",
Second University of Naples - President of BENECON SCaRL

Massimo Giovannini

Professor, University "Mediterranea" of Reggio Calabria, Italy

Xavier Greffe

Professor and Director, Centre d'Economie de la Sorbonne Paris, France

Manuel Roberto Guido

Director Enhancement of Cultural Heritage,
Planning and Budget Department,
Italian Ministry of Heritage and Culture

Bernard Haumont

Professor, Ecole Nationale Supérieure d'Architecture,
Paris Val de Seine, France

Mathias Kondolf

Professor and Chair,
Landscape Architecture and Environmental Planning,
University California Berkeley, USA

David Listokin

Professor, Edward J. Bloustein School of Planning and Public Policy,
Rutgers University, USA

Maria Dolores Muñoz

Professor, UNECO Chair, EULA Environmental Centre,
University of Concepcion, Chile

Jorge Peña Díaz

Professor, Decano de la Facultad de Arquitectura,
Instituto Superior Politécnico José Antonio Echeverría, Cuba

Giovanni Puglisi

Professor, Rector IULM e
President Italian National Commission for UNESCO

Maria Grazia Quieti

Ph.D., Executive Director,
The U.S.- Italy Fulbright Commission

Michelangelo Russo

Professor, University Federico II di Napoli, Italy

Lucio Alberto Savoia

Ambassador and General Secretary,
Italian National Commission for UNESCO

Elena Shlienikova

Professor, Director of the Project Support Center of Regional and International Programs
of the Russian Presidential Academy of National Economy and Public Administration,
Russia

Eusebio Leal Spengler

Professor, honorary president of the Cuban ICOMOS Committee, Cuba.

Isabel Tort

Professor, Director of the Forum UNESCO
University and Heritage (FUUH) Programme,
Universitat Politècnica de València UPV, Spain.

Andrey V. Vasilyev

Professor and Director, Institute of Chemistry
and Environmental Engineering, Togliatti State University, Russia

Organizing and Scientific Local Committee:

Department of Architecture and Industrial Design "Luigi Vanvitelli",
Second University of Naples

Manuela Piscitelli

Responsible for the organizing process
of the scientific proposal

**Alessandra Cirafigi,
Caterina Cristina Fiorentino**
Graphics and Communication

Luciana Mainolfi

*Administrative responsible
for the management and the financial control*

Alessandro Ciambrone

Relationships with the International Scientific Committee

Giuseppe Klain

Web master

**Pasquale Argenziano,
Alessandra Avella,
Fabio Converti,
Maria Cristina Miglionico,
Nicola Pisacane,
Gabriella Abate,
Antonino Calderone,
Gaia Giordano.**

Peer review Scholars has been invited to submit researches on theoretical and methodological aspects related to Heritage, Architecture and LanDesign, and show real applications and experiences carried out on this themes.

Based on blind peer review, abstracts has been accepted, conditionally accepted, or rejected. Authors of accepted and conditionally accepted papers has been invited to submit full papers. These has been again peer-reviewed and selected for the oral session and publication, or only for the publication in the conference proceedings.

Conference report 200 abstracts received from:

Australia, Austria,
Brazil,
Canada, Chile, China, Cyprus,
Denmark,
France,
Germany, Greece,
India, Israel, Italy,
Jamaica, Jordan,
Kingdom of Bahrain, Kosovo,
Lebanon,
Malaysia, Malta, Morocco, Mexico,
New Zealand,
Poland, Portugal,
Russia,
Serbia, Slovak Republic, Spain,
Tunisia, Turkey,
Ukraine, United Kingdom, U.S.A.

About 300 authors involved.

157 papers published.

Preface The XI edition of the International Forum Le Vie dei Mercanti entitled Heritage, Architecture, LanDesign aims to promote an international debate on local experiences relating to the issues of conservation, regeneration and innovation in heritage, architecture, landscape and design.

In recent years, technological developments have revolutionized not only the forms that surround us but also our daily routines. However, this new global language often does not take into consideration the identity and vocation of the area, which require appropriate courses of action in relation to both the individual context and local traditions.

The historical memory of the characteristics of the identity, local materials, building traditions as well as the tangible and intangible cultural heritage is a repertoire of signs to draw from in order to operate within each historical context and consequently enhance its uniqueness.

The recovery of the authentic vocations of a place does not mean inaction, but rather regeneration through measures to enhance an area by increasing its natural strengths, transforming the weaknesses into opportunities for future development based on innovation.

The international comparison can be an opportunity to share good examples of conservation, regeneration and innovation related to the tangible and intangible heritage in its broadest sense; architecture intended as the identity of the places that shapes the landscape, from traditional to global forms; design at all scales, from the object to the territory, in a sustainable way to start a process of regeneration through a new relationship between man and the environment.

The conference is open to multidisciplinary experiences of one or more of the proposed themes. Scholars are invited to submit research on theoretical and methodological aspects as well as present experiences and practical applications carried out on these issues.

Carmine Gambardella

Pag. 24 **ID 000**
Architecture, heritage, landscape, in time of crisis
Carmine GAMBARDELLA

Table of contents _ HERITAGE

P. 35 **ID 001**
Noli Me Tangere – On Touch
Monika BOGDANOWSKA

P. 43 **ID 002**
A New Cultural Landscape: The Historic District of Zhong Shan
Livio SACCHI

P. 52 **ID 004**
Disclosure of Historic and Cultural Potential and Proposal for Restoration of the Castels of the Western Ukraine
Jawdat GOUSSOUS, Galina TOTOVITSKAYA

P. 59 **ID 005**
Documenting the Architecture of Modernism in European Seaside Centers. Case Study in Italy and Bulgaria
Manuela PISCITELLI, Milena KICHEKOVA

P. 69 **ID 014**
Brazilian Parties: The Transformation of Obligation into Fun
Maria Cristina CAPONERO

P. 77 **ID 015**
Pursuit of Style: the Importance of Historical, Archivistic and Treatise Heritage
Cristiana BEDONI, Daniele CALISI

P. 87 **ID 016**
Heritage Management in Sydney, Australia – a Case Study on The Replacement of Degraded Sandstone on Heritage-Listed Buildings
Elanor PITT, Emma CULLEN, Gwénaëlle PROUST

P. 97 **ID 023**
The “Neustadt” of Strasbourg: Perception and reception of a late 19th century urban extension project at the interface of France and Germany
Johannes DAHM, Sophie EBERHARDT

P. 107 **ID 028**
From the Concept to an Environmental Design of Gaudì: The Batllò House
Leonardo BOGANINI, Lidia PADRICELLI

P. 114 **ID 030**
The Reconversion of Italian Fortress Through the Use of Modern Tools
Alice PARRI, Laura BENASSI, Denise LA MONICA, Eliana SIOTTO, Marco CALLIERI, Paolo PINGI, Roberto SCOPIGNO

P. 123 **ID 032**
Investigation and Knowledge for promoting cultural heritage
Antonella DI LUGGO, Riccardo FLORIO, Massimiliano CAMPI

P. 132 **ID 034**
Beauty and Sustainability - Survey an Liberty Heritage an Varese and Ticino Area
Anna ANZANI, Angela BAILA, Claudia CARMEL, Margherita GUARISCO

- P. 142** **ID 036**
Heritage and Sustainable Development: The Middle East and Doha
Francesca Romana MORETTI
- P. 150** **ID 038**
Industrial heritage, the *Fabra I Coats* engine room in Barcelona: a terrestrial laser scanning pointcloud classification
Juan Manuel CORSO, Alejandro MARAMBIO, Pilar GARCIA-ALMIRALL
- P. 160** **ID 039**
Southeast Asia's Built Heritage at the Cross-Roads –
How to Reconcile Tradition and Modernity within Competing Constraints
Ahmad Najib ARIFFIN
- P. 170** **ID 040**
Archaeology and Architectural Design. Project for Alexandria in Aria-Herat (Afghanistan)
Luisa FERRO
- P. 181** **ID 047**
A Settlement of The Knights of Malta in Campania: the *Castrum* of Cicciano (Na)
Maria Archetta RUSSO
- P. 191** **ID 048**
The valorisation of Italian rural historical buildings and territory
Valentina CINIERI, Emanuele ZAMPERINI
- P. 201** **ID 053**
Peripheral Porosity: Cultural Landscapes of Indigenous Heritage Conservation
Hannah Hunt MOELLER
- P. 208** **ID 054**
The End of Urban Exploitation and the Rise of the Urban Imaginary:
Histories and Futures of Detroit, Michigan
William MARTIN
- P. 218** **ID 055**
The San Antonio River: a Rich and Complex Cultural Landscape in Texas
Angela LOMBARDI, Sedef DOGANER
- P. 227** **ID 056**
Managing Heritage Sites while Accelerating Cultural heritage. Tourism in Antalya, Turkey
Sedef DOGANER, Angela LOMBARDI, Ege Uluca TUMER
- P. 236** **ID 057**
The Historic Center of Lima, Peru: a Gis Database as a Tool for Safeguarding and Developing
Angela LOMBARDI, Patrizia MONTUORI
- P. 245** **ID 061**
Memories in stone
Ornella ZERLENGA
- P. 256** **ID 063**
Eminent De[con]struction: Conservation Acts of Modern Vandals within Built Forms, Landscapes and Cities
Catharine PYENSON
- P. 262** **ID 066**
Hidden Cultural Landscapes: Survey and Digital Enhancement of The Catacombs of San Giovanni in Syracuse
Elisa BONACINI, Graziana D'AGOSTINO, Mariateresa GALIZIA, Cettina SANTAGATI, Mariarita SGARLATA

- P. 272** **ID 068**
Integrated Approach to Museology: Proposal for a Route Linking Archaeological sites in Çanakkale, Turkey
Harun BATIRBAYGIL, Susana ALVES, Bahar BASER, Ayse Özbil TORUN
- P. 278** **ID 069**
Comparison of 3D Documentation Methods in Sculptural Figures with Poor Radiometric Information: Shape from Stereo vs Shape from Silhouette
Antonio ÁLVARO TORDESILLAS, Jorge GARCÍA FERNÁNDEZ, Salvatore BARBA
- P. 287** **ID 076**
Ancient Ruins of the Future
Adriana ROSSI
- P. 297** **ID 079**
The Monumental Unit of Massenzio: environmental requalification project and development of the archaeological emergencies
Maria Grazia CIANCI
- P. 308** **ID 081**
The Matter of Architecture: the Medieval Walls of Benevento
Luigi GUERRIERO, Luigi D'ORTA, Antonietta MANCO, Francesco MIRAGLIA
- P. 316** **ID 088**
Dwelling on the Past - Built Heritage and Urban Development Policies.
The Case of Vienna (Austria)
Barbara RIEF VERNAY
- P. 325** **ID 092**
Turin for the French
Nadia FABRIS
- P. 330** **ID 095**
Building a new landscape. Land reclamations and new rural towns during the fascist regime along the Coast South of Salerno
Antonella MARCIANO
- P. 341** **ID 103**
Sensory Experience in Architectural Memory: Transformation of Industrial Buildings
Mads Harder DANIELSEN
- P. 349** **ID 106**
Characters of The Rural Heritage in the Var
Laura BLOTTO
- P. 357** **ID 109**
Permanences and morphologies of historic landscapes. The hill of the Vomero in Naples
Maria MARTONE
- P. 367** **ID 111**
A Landscape in Transition or a Landscape in Danger? The Olive Groves' Cultural Landscape of Corfu
Spyridoula ARATHYMOU
- P. 372** **ID 112**
Landscape as Cultural Heritage – the Several Dimensions of Heritage Management – Aljezur and the Vicentina Coast Portugal
Maria João PEREIRA NETO, Mário S. Ming KONG, Andreia GARCIA, Pedro JANUÁRIO
- P. 379** **ID 116**
Becoming the Olympics: the Sound Proof Series of Exhibitions (2008-2012)
Monica BIAGIOLI

- P. 389** **ID 117**
The rural landscape in Campania. The role of the graphic representation in the documentation and valorization process
Stefano CHIARENZA
- P. 399** **ID 127**
Milan-Turin: a bundle of infrastructures to access to a network of places, between cultural heritage and landscape
Andrea ROLANDO, Alessandro SCANDIFFIO
- P. 407** **ID 128**
Water and its forms. Natural elements semantic icons in Turin
Maria Paola MARABOTTO
- P. 414** **ID 129**
Historic Gardens as a Part of the National Cultural Heritage – a short view on a garden history in Bratislava, the Slovak Republic
Tamara REHÁCKOVÁ
- P. 424** **ID 137**
The origin of the conservation of the twentieth century architecture in France: the action of Andre Malraux in favor of Le Corbusier's work
Antonella VERSACI, Alessio CARDACI
- P. 434** **ID 142**
Understanding Location Preferences of Entrepreneurs and Innovators in Historic Maritime Cities
Laurie ZAPALAC
- P. 444** **ID 144**
"The Fragile Ecosystem of Memory": Literary House Museums in New Zealand
Elizabeth AITKEN ROSE
- P. 454** **ID 145**
Representation and Continuity. The regeneration of the area, the city and the architecture
Paolo GIORDANO
- P. 464** **ID 147**
The Conservation of Jerusalem's City Walls
Avi MASHIAH
- P. 473** **ID 155**
Two Different Approaches of Urban Renewals of Historical Districts: the Comparison of Bordeaux, France and Cincinnati, United States
Ana Gisele OZAKI
- P. 483** **ID 160**
Palazzo Marziani in Furnari Project of Restoration and Reuse
Alessandra MANIACI, Caterina GULLO
- P. 491** **ID 161**
Greater Amman: Metropolitan Growth and Scenarios for Sustainable Urban Development
Ahmed ABU AL HAIJA, Rob POTTER
- P. 502** **ID 164**
The Challenge of Urban Sustainability in Seaside Cities Between Unlimited Growth and Serene Degrowth
Massimo CLEMENTE, Daniele DEMARCO, Eleonora GIOVENE DI GIRASOLE
- P. 510** **ID 171**
Port Cities, Peoples and Cultures: Waterfront Regeneration and "Glocal" Identity
Gabriella ESPOSITO DE VITA, Stefania OPPIDO, Stefania RAGOZINO

- P. 522** **ID 176**
 Bioclimatic Structures Design for the Archaeological Park of Nola
Antonella VIOLANO, Lucia MELCHIORRE
- P. 529** **ID 177**
 The Missing "Fan Vineyard" in San Leucio (Caserta, Italy). An "Agri+Cultural" Heritage" of "Two Sicilies" Borbone House
Andrea BUONDONNO, Eleonora GRILLI, Rosaria PARENTE, Nicola PISACANE
Pierclaudio ODIERNA, Gian Franco CAPRA, Sergio VACCA
- P. 538** **ID 181**
 The "Capri style", a Debate Over a Century. Architecture, Environment and Preservation in the Island of the Sirens Since the Convention on the Landscape of 1922
Elena MANZO
- P. 547** **ID 182**
 The Management Plan of Unesco Sites: from the Conceptual Model to the Methodology Application through Gis
Lina ABATEGIOVANNI
- P. 557** **ID 190**
 Promotion of cultural heritage as an engine for territorial development in France
Alessandro CIAMBRONE

Table of contents _ ARCHITECTURE

- P. 568** **ID 006**
 "Santa Sapienza allo studio" Chapel in Rome: a representation of its domed ceiling. Borromini master of "Trompe-l'œil"
Antonio MOLLICONE
- P. 578** **ID 007**
 Survey of the architectural and historical characters of the Pavone "ricetto" for the retrieval of its own environmental identity
Pia DAVICO
- P. 588** **ID 009**
 The Conservation Project of the Roman Theater of Málaga
Esteban José RIVAS LÓPEZ, María Victoria, LÓPEZ GALLARDO
- P. 598** **ID 013**
 Designing Future Heritage: Aldo Rossi's *Citta Analoga* as Incomplete Algorithm of Individual Expression within Collective Imagination
Jean-Pierre CHUPIN
- P. 606** **ID 018**
 Kultur-Fabrik-Perugia
Paolo BELARDI, Valeria MENCHETELLI, Luca MARTINI
- P. 614** **ID 019**
 Interpreting the Transformation of the Identity of Asmalimescit
Avsar KARABABA
- P. 623** **ID 020**
 Avalanche hazard on mountain chalets: prevention and modelling
Bernardino CHIAIA, Barbara FRIGO, Valerio DE BIAGI

- P. 632** **ID 027**
The gap between the developed and the experience in the architectural space
Najjar ONS
- P. 640** **ID 033**
Love_As
Iosif DAKORONIAS-MARINA, Michalis STOUPAKIS
- P. 650** **ID 045**
Urban strategies to regenerate the moroccan public space in the urban tradictional tissues
Fatimzahra BENHAMZA
- P. 659** **ID 046**
Spomenik in Flux
Erika LINDSAY
- P. 666** **ID 050**
Assessment of the Bioclimatic Elements of Vernacular Architecture. The Historic Centre of Nicosia, Cyprus
Maria PHILOKYPROU, Aimilios MICHAEL, Stavroula THRAVALOU
- P. 676** **ID 051**
Structural Assessment of a Roman Aqueduct 'Pont Del Diable' in Tarragona by F.E.M.
Jaume FABREGAT, Anna ROYO, Agustí COSTA, Gerard FORTUNY, Josep LLUÍS
- P. 685** **ID 064**
Plurisensory Approach as a New Technological Way for Building Design
Luigi MOLLO, Rosa AGLIATA, Carlo GIUDICIANNI
- P. 691** **ID 065**
Monitoring and storage: integrated survey of the old towns “crater”
Caterina PALESTINI
- P. 697** **ID 072**
Relocating the Past in Amman: Iraqi Architecture and Identity after Displacement
Sonia AL-NAJJAR
- P. 708** **ID 077**
A virtual garden: the scenographic Jappelli's engravings for “Palazzo della Ragione” in Padua
Andrea GIORDANO, Cosimo MONTELEONE, Isabella FRISO, Marco PEDRON
- P. 719** **ID 080**
Semantic 3D Models: Surveying and Drawing the Virtual City
Maurizio UNALI
- P. 724** **ID 082**
The functional node of traditional house in Kosovo
Flamur DOLI, Jetik DOLI
- P. 734** **ID 083**
Modular low-cost scenery to mounting some events: the example of the church of San Giuseppe delle Scalze
Alessandra PAGLIANO
- P. 744** **ID 084**
Practice of reuse and recycle in retrofit interventions
Raffaella DE MARTINO, Rossella FRANCHINO, Caterina FRETTOLOSO
- P. 750** **ID 089**
Drawing for the analysis of architectural language: the case of Giuseppe Palazzotto
Eugenio MAGNANO DI SAN LIO, Mariateresa GALIZIA, Cettina SANTAGATI

- P. 758** **ID 094**
Air Movement: from Tradition Towards Innovative Experiences
Fosca TORTORELLI, Francesca MUZZILLO
- P. 764** **ID 096**
The everyday and the monument, a case study of two UNESCO World Heritage sites: the wooden churches of Vilupulli and Ichuac
Constantino MAWROMATIS
- P. 774** **ID 097**
The quality of bridge design in the general design process
Michele CULATTI
- P. 780** **ID 098**
Historical centers in seismic area: methodology for conservation, prevention and reconstruction. The case study of Villa Sant'Angelo
Davide INDELICATO
- P. 788** **ID 100**
The roman amphitheater of Syracuse: archaeological artifact forgotten
Giuseppe DI GREGORIO, Domenico GIACCONE, Angelo MONTELEONE
- P. 796** **ID 101**
The Interlacing Arches System in Salerno and Amalfi Coast
Barbara MESSINA
- P. 806** **ID 105**
Digital Reconstruction of the Maritime Theatre in Hadrian's Villa at Tivoli
Alberto SDEGNO
- P. 815** **ID 113**
In Place
Maria Ines PASCARIELLO
- P. 821** **ID 114**
Structural building information modeling of casale castello
Ingrid TITOMANLIO, Giuseppe FAELLA
- P. 829** **ID 120**
Functional recovery and structural refurbishment of disused industrial buildings: an integrated approach
Ingrid TITOMANLIO, Giulia MATERAZZI
- P. 838** **ID 121**
Challenges in the field of heritage conservation in the developing world: a case study of Bihar, India
Kamini SINHA, Shailendra Kumar MANDAL
- P. 846** **ID 122**
Decoding a merchant town: photography, history and survey
Antonella SALUCCI
- P. 855** **ID 123**
The historic fabric of Naples. Via Banchi Nuovi between regeneration and conservation
Daniela DE CRESCENZO, Carmela FRAJESE D'AMATO
- P. 860** **ID 124**
Characterization of Uncertainty and Approximation in Digital Reconstruction of CH Artifacts
Fabrizio I. APOLLONIO, Marco GAIANI, Zheng SUN

- P. 870** **ID 125**
A Synergy of Addends for the Definition of a Charter of Protection
Giacinto TAIBI, Rita VALENTI, Mariangela LIUZZO
- P. 880** **ID 130**
Multidisciplinary team activity for BIM using interoperability. A PhD course experience at Politecnico di Torino working on existing buildings
Anna OSELLO, Andrea ACQUAVIVA, Anna PELLEGRINO, Elena CANDELARI
Giacomo CHIESA, Daniele DALMASSO, Matteo DEL GIUDICE, Kamila MANNANOVA
Iasef MD RIAN, Michel NOUSSAN, Edoardo PATTI, Marco PIPPIONE
Alessandro SERRA, Rajabzadeh SHAGHAYEGH, Zhu SHICHAO, Riccardo TOMASI
- P. 890** **ID 132**
The Arab-Norman civil architecture in Palermo: enhancement strategies
Irene TRENTO, Liboria Laura ZABBIA
- P. 899** **ID 133**
Cultural Heritage and "Freedom of Panorama". Representing Italian Identity
Enrica BISTAGNINO
- P. 905** **ID 136**
Between anti-museum and interactive museum: the case study of Paolo Orsi in Syracuse, Italy
Alessio CARDACI, Antonella VERSACI, Luca FAUZIA
- P. 915** **ID 138**
A New representation of an Ancient Monument. La Piscina Mirabile
Raffaele MARTINELLI
- P. 923** **ID 140**
The oval cloister of Santa Maria alla Sanità Church: a virtual representation of the original destroyed shape
Roberta MONTELLA, Emanuela LANZARA
- P. 929** **ID 141**
Geoconservation analysis at Ackendown, Jamaica defining geoarchitecture
Patricia Elaine GREEN, Sherene Andrea JAMES-WILLIAMSON
- P. 939** **ID 146**
Building information modeling. An instrument of knowledge for the fortified architecture
Luigi CORNIELLO
- P. 949** **ID 150**
Control and reuse of the rainwater in the urban context
Rossella FRANCHINO
- P. 954** **ID 158**
Standardisation of the design process using BIM Software
Saverio D'AURIA, Davide BARBATO
- P. 962** **ID 162**
The court house in rural and urban by Campania - Private and public in educational experiences and design architecture
Massimiliano RENDINA
- P. 970** **ID 163**
The museum of the territory. Notes for active conservation
Efisio PITZALIS
- P. 980** **ID 166**
Design of multimedia archaeological park in the mediterranean area. Survey, modelling and communication. The case of Leptis Magna
Andrea MANTI, Chiara SCALI, Domenico TOSTO

- P. 988** **ID 169**
Smart communities and local company museums: two new concepts for the Mediterranean Museum System of Design and Applied Arts
Claudio GAMBARDELLA, Jochen SIEGEMUND
- P. 999** **ID 178**
Measurement, Representation and Rural Architecture Exploitation: Knowledge through Historical Maps from Mills to Hydropower Stations
Fabio CONVERTI
- P. 1013** **ID 180**
Sprawl Repair. Site-specific tools for Neapolitan sprawl town
Fabrizia IPPOLITO
- P. 1017** **ID 183**
Design the monument in the twentieth century. Innovation and tradition
Saverio CARILLO
- P. 1027** **ID 184**
The Beuronese School and the Schwarz's essays in the architecture sacred of the XX century
Maria Carolina CAMPONE
- P. 1037** **ID 185**
The contribution of diagnostics in architectural survey; case study of combined thermography application
Gerardo Maria CENNAME
- P. 1044** **ID 188**
The room ablation of Hafsid era in Tunis (XV cent.): architectural and artistic aspects
Lamia HADDA
- P. 1051** **ID 189**
18th Century's cheap and lower-class dwellings in Caserta
Riccardo SERRAGLIO
- P. 1061** **ID 192**
Borgo Appius - Borgo Domitius
Gianluca CIOFFI
- P. 1071** **ID 196**
New urban models in the vesuvian Sarno plain
Carlo A. MANZO, Marino BORRELLI, Emanuele CARRERI, Carlo COPPOLA, Francesco COSTANZO, Efisio PITZALIS, Massimiliano RENDINA, Gianluca CIOFFI, Maria Antonia GIANNINO, Gaspare OLIVA, Andrea SANTACROCE, Pasquale ZEPPELELLA, Rejana LUCCI, Enrico CARAFA
- P. 1079** **ID 197**
Urban Regeneration. Methods and Strategies
Maria Antonia GIANNINO, Agrippino GRANIERO, Gaspare OLIVA, Ferdinando ORABONA
- P. 1089** **ID 198**
The Rural Homestead of Casignano: taken from Documents Regarding the Monument
Rossella BICCO
- P. 1093** **ID 200**
Saint Lawrence outside the walls. Notes on the nineteenth-century restoration by Virginio Vespignani
Cesare CUNDARI, Gian Carlo CUNDARI, Maria Rosaria CUNDARI

Table of contents _ LANDESIGN

- P. 1104** **ID 003**
Kusadasi, the Ancient 'Scalanova'
Ahmet Vefik ALP
- P. 1110** **ID 010**
New Contemporary Art Museum Buenos Aires
Anna MANDIA
- P. 1115** **ID 012**
Confronting Contemporary Sustainability Norms with the Durability of Historical Buildings
Carmela CUCUZZELLA
- P. 1123** **ID 021**
The Influence of New Technologies on Sustainable Parks: Duisburg North Park and Central Park Valencia
Carmen VESES JIMENEZ, Ignacio BOSCH REIG
- P. 1132** **ID 024**
Linear limbic spaces between land and sea: landscape designing in river Evro's delta
Eleni OUREILIDOU
- P. 1142** **ID 031**
Affirmation and Integration of Architectural Heritage in Urban Landscape: Contribution of Landscape Architecture
Jelena RAKOCIJA, Marko DIMANIC
- P. 1150** **ID 052**
Making Belief: Taste-Making, the Public Imagination, and the Spaces of Everyday Life
Tim WATERMAN
- P. 1158** **ID 060**
Planning Form the Awareness of a Place
Miguel A. MEDINA
- P. 1168** **ID 062**
A Discussion On The Micro-Scale Urban Preservation Projects In Turkey
Seyda GÜNGÖR AÇIKGÖZ, Burcu CEYLAN
- P. 1176** **ID 067**
A Transparent Choice
Antonella VIOLANO, Francesca VERDE
- P. 1183** **ID 073**
Approaches to environmental impact assessment of physical pollutions of territories during design and construction of industrial objects and its realization in Samara Region of Russia
Andrey VASILYEV, Vitaly BUKHONOV, Vladislav VASILYEV
- P. 1191** **ID 074**
Approaches to classification and to reduction of negative impact of lubricating cooling liquids
Andrey VASILYEV, Pavel MELNIKOV, Vlada ZABOLOTSKI KH
- P. 1196** **ID 086**
The ISO 50001: a tool of energetic management of architectural public heritage
Monica CANNAVIELLO
- P. 1200** **ID 087**
Design and handcraft for new creative dimension of industry
Marco BORRELLI

- P. 1210** **ID 090**
 Visione sostenibile (Sustainable Vision in the Conservation of Cultural Heritage Project)
Anna MAROTTA
- P. 1220** **ID 110**
 The quarry landscape of Guidonia Montecelio in Lazio. Knowledge, survey and project of a built environment
Laura FARRONI, Annalisa METTA
- P. 1230** **ID 134**
 Cultural landscapes in transition: representation and relationship between shape and context
Serena ABELLO, Chiara CANNAVICCI
- P. 1240** **ID 152**
 Sustainable LanDesign for Archeology
Ottavia GAMBARDELLA
- P. 1245** **ID 153**
 Use of a scale model under artificial sky for daylighting design
Antonio ROSATO, Michelangelo SCORPIO, Sergio SIBILIO
- P. 1253** **ID 154**
 Simeto valley
Alessandra MANIACI, Alessandra BRANCATELLI
- P. 1261** **ID 167**
 Towards a theory of impermanence
Silvana SEGAPOLI
- P. 1268** **ID 168**
 Landesign "Between Agnena and Regi Lagni"
Vincenzo POLLINI
- P. 1275** **ID 170**
 The project expression of aesthetic quality within the culture of physical transformation
Paola GIANNATTASIO
- P. 1286** **ID 174**
 Design of energy systems through the crop circles geometry
Claudia CENNAMO, Rosanna DRAGO
- P. 1294** **ID 175**
 The Analytic Network Process (ANP) as environmental assessment tool to design an eco-museum in Pompei
Maria Cristina MIGLIONICO, Giuseppe D'ANGELO
- P. 1301** **ID 179**
 Sustainable Design and sense of funny
 Cognitive survey methods and riassertion of identities
Antonino CALDERONE
- P. 1314** **ID 186**
 Representing urban landscapes. Narration and sense-making
Alessandra CIRAFICI, Caterina C. FIORENTINO
- P. 1324** **ID 187**
 Authenti-city. A militant design project
Caterina C. FIORENTINO, Alessandra CIRAFICI

- P. 1334** **ID 191**
Hyperspectral and thermal airborne surveying for the characterization and the monitoring of natural and anthropized environment
Carmine GAMBARDELLA, Pasquale ARGENZIANO, Alessandra AVELLA
Stefano BASTONI, Giuseppe CASBARRA, Flaviano TESSITORE
- P. 1358** **ID 194**
The New Landscape
Mario PISANI
- P. 1364** **ID 199**
The SEEM project: a Solar Eco-Efficient Envelope Model
Stefano ALBRIZIO, Bernardo BUONOMO, Lorenzo CAPOBIANCO,
Corrado DI DOMENICO, Amedeo FIORE, Walter FIORE, Rossella FRANCHINO,
Caterina FRETTOLOSO, Carmine GAMBARDELLA, Luciana MAINOLFI, Oronzio MANCA,
Francesca MUZZILLO, Sergio NARDINI, Paolo ROMANO, Antonella VIOLANO
- P. 1372** **ID 201**
Regina Viarum, Appia Antica
Gilda EMANUELE
- P. 1377** **ID 202**
Landscape design and sustainable development: from smart City to the smart Land
Tatiana KIRILOVA KIROVA, Davide MEZZINO

The Ablution Room of the Hafsid dynasty in Tunis: architectural and artistic aspects

Lamia HADDA

Department of Architectural and Industrial Design "Luigi Vanvitelli", Second University of Naples, Aversa, Italy.

lamia.hadda@unina2.it

Abstract

Starting Ottoman era to the present day, the Hafsid monuments of the Medina of Tunis have undergone major transformations both from a structural and from stylistic-formal point of view. In many cases, the refurbishing have completely deleted the elevation of the original buildings, leaving only the fundamental trace of typological system. In other rare cases, however, it has preserved the original architectural structure, as the case of ablution room *Mid'at es-Soltāne*, built between 1448 and 1450.

The monument is located in the heart of the old town, down the road that leads to the *sūq al-'Attarin* (market Perfumers). This is an area adjacent to the mosque *al-Zaytūna* for the faithful who use the site for the ritual washing of the Muslim prayer. The room has a unique architectural style that draws much from the artistic traditions of Eastern from Syria and Egypt in particular.

The research is based on the study of the surviving parts of the planimetric and formal components by means of a systematic reading of the architecture of the second half of the fifteenth century in Tunisia and the Near East.

Keywords: Ablution Room, Hafsid architecture, *Mid'at es-Soltāne*, Medina of Tunis.

At the end of the Almohad dynasty (1147-1269), North Africa was ruled by three dynasties that were in constant conflict: the Marinid dynasty (1196-1465), that lived in Morocco; the western part of Algeria was under the control of the *Abd al-Wadids* (1235-1500); while the Hafsids (1235-1575) governed the eastern part of Algeria, modern day Tunisia and the west of Lybia. Under the constant threat of incursions by the surrounding Berbers, these dynasties fought for the hegemony of North Africa [1].

The founder of the Hafsid dynasty was Abū Zakariyā Yahya ibn Abī Hafs, known as Abū Zakariyā I (1228-1249). Whilst in Marrakesh, the capital of the Almohad kingdom, he declared his autonomy over the Ifriqiya territory. The hafsids princes governed Tunisia for almost three hundred years with its capital based in Tunis [2].

It was only towards the middle of the 14th century that the Hafsids were threatened from the west by the Marinids from Morocco, occupying the capital twice in 1349 and 1356. After the fall of Granada (1492), the Spanish – using naval power - threatened the coast of Maghreb up to Tunis. In the same period, the Barbary pirates, led by Redbeard, who had already occupied Algiers (1516), conquered Tunis in 1534, thus ending the reign of the Hafsid sultan Muhammad ibn al-Hasan (1573-1574). The rising power of the Spanish and the consequent fear of the Barbary pirates, led to the invitation for Turkish intervention which brought about the Ottoman conquest of Tunis under Sinan Pasha in 1574 [3]. From that time to the present period, the Hafsid monuments of the city have undergone significant transformations both from a structural and a formal-stylistic viewpoint. In many cases the change has completely modified the original buildings leaving only traces of the original foundations. Instead, in rare cases, the architectural structure has remained intact.

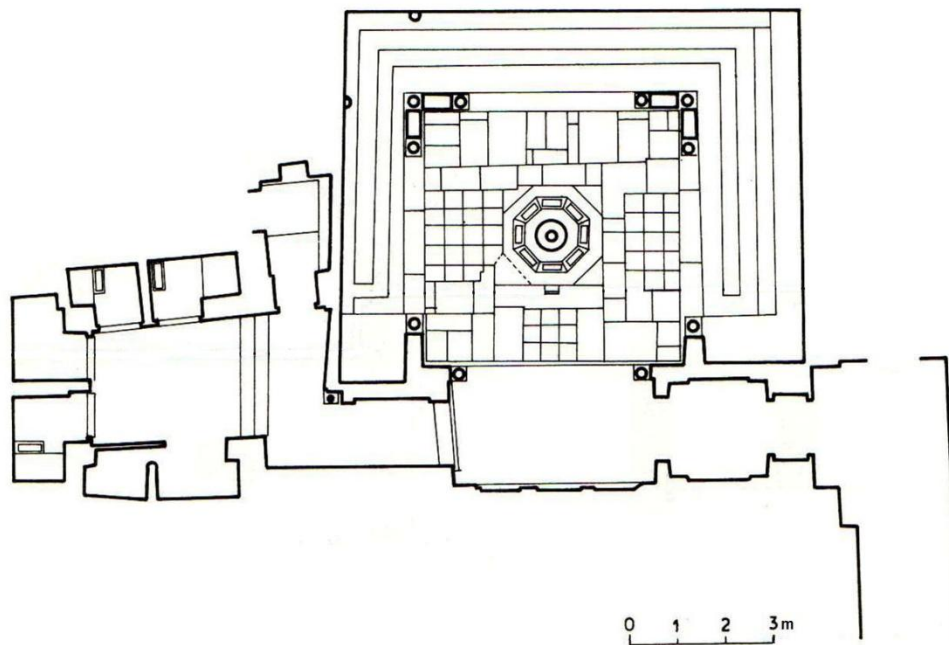


Fig. 1: Tunis, ablution room, floor plan.

In effect, Hafsid Tunisia went through a period of great economic and cultural prosperity under princes Abū Fāris 'Abd al-'Aziz (1394-1434) and Abū 'Amr 'Uthmān (1436-1488); many monuments were, in fact, built during this period. Among the most famous are: the Al Qasba with its mosque, the restoration of the *al-Zaytūna* mosque, with the annexion of the library, and the building of a prestigious ablution area called *Mid'at es-Soltāne* between 1448 and 1450 [4].

This monument is found in the heart of the historical centre, at the end of the road which leads to *sūq al-'Attarin* (market of the perfume makers). It is an area annexed to the great *al-Zaytūna* mosque, used by worshipers to wash according to the traditional rituals of the Muslim faith.

Written sources say that the monument was commissioned by the Hafsid sultan Abū 'Amr 'Uthmān (1436-1488). The building of the monument was presided over by the architect Ahmad al-Qusantini with work starting in 1448 and ending two years later [5]. The building has undergone some reconstruction especially of the wooden covering as can be seen from an inscription on a beam which dates back to the 18th century [6]. The rest of the building is in pure Hafsid style: the portal, the arches, the capitals, and the fountain.

The entrance still preserves an elegantly decorated portal in two-tone marble with columns adorned with Hispano-Moorish capitals. The architrave is enhanced by a large slab made of ashlar blocks of black and white marble arranged with horizontal courses at the sides and radiating from the centre. Towards the middle of the 13th century the French architect Villard de Honnecourt paid particular attention to this technical process for stone. In his notes, kept in the National Library in Paris (Ms. fr. 19093, tav. XL, fol. 20), the famous architect describes the technique used to cut blocks for an arch in such a way as to obtain blocks which are suitable to be placed radially [7].

The entrance door leads to two halls, separated by horseshoe shaped arches with two-tone ashlar blocks and surmounted by a rectangular panel decorated with strips of black marble which form three quadrants of black and white marble with a star enclosed in a square in the middle.

The inlaid panels used to decorate the walls are representative of two-tone geometrical decorations. They can be summarized according to various fundamental geometrical shapes: flat arches or medallions composed of thin strips with ashlar blocks in different shapes; stars, intertwined, cylindrical, polygonal. They have all been created through the use of inlaid black marble strips on white marble.

The ornate with stellar motifs uses the basic principles of geometry, repetition, subdivision and multiplication to create a multitude of designs. The source of inspiration is the polygonal composition which normally originates from a central circle divided by polygons from which the various polygonal weaves (called stellar) develop. They are formed by surfaces of perfect proportions. The star forms part of the originating motifs of the geometric decoration to such an extent as to be counted as the most symbolic of Islamic art [8].

This type of inlaid decoration is found in Hafsid architecture on both walls and floors as we can see, for example, in the internal courtyard of the mausoleum of Sidi Qāsim al-Zalījī (second half of the 15th century) [9].

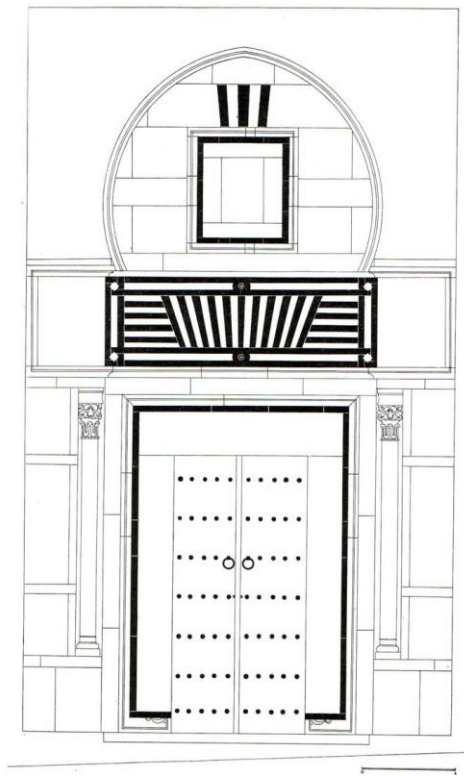


Fig. 2: Tunis, ablution room, frontal view of the entrance.

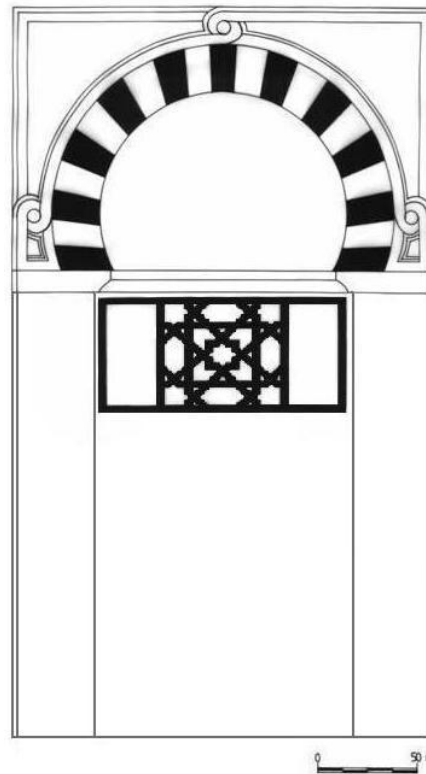


Fig. 3: Tunis, ablution room, main hall, frontal view of a blind niche.

The fulcrum of *Mid'at es-Soltāne* is composed of a peristyle square room surrounded by four large horseshoe shaped arches with two-tone ashlar blocks which lie on Hispano-Moorish capitals. The arched lintels of the arches are covered with slabs of black and white marble and are decorated with geometrical motifs. In the middle of the room there is an octagonal fountain, whose facades have panels of marble that are almost a metre high and which are decorated with imaginative geometrical motifs.

At the base of the piers, on both sides, a snake like decoration carved in relief can be seen. It is often presented in the shape of one or two spirals whose surface is covered with scales and is very similar to the palmettes on the Hispano-Moorish capitals in Tunis of the same period. This motif is also present in other monuments of the Hafsid era: on the piers of the doors of the mausoleums of Sidi Ben Arus, Sidi al-Kala'i and Sidi Qāsim al-Zalījī and on the door of the library of Abū 'Amr 'Uthmān in the *al-Zaytūna mosque* in Tunis [10]. Therefore, it can be said that the snakelike ornamental motif subsequently developed, elaborately, and is used extensively in Ottoman buildings and religious monuments [11].

The beauty, and the particular style, of the room drew the attention of many scholars of the time. Among these the famous poem by ad-Damāmini can be recalled. It defined *mid'at* as a beautiful building built in a perfect architectural style which is so elegant and finely executed to the point that it can be considered a model in its genre [12]. The shapes, and the architectural and decorative techniques used in the Ablution room recall the Ayyubid and Mameluke buildings in Syria and Egypt built in the 14th and 15th centuries, where similar motifs are found in black and white inlaid marble which were used to exhalt the chromatic elements inside the monuments [13]. Among the most famous examples in Cairo are the masonry face of the funeral hall of Madrasah of Barkuk (14th century) and of the Ahmed al-Bardini mosque (15th century), the floor of the funeral mosque of the sultan *al-Malik al-Ashraf Barsabay* (1421-1438) and of the *Maqsura* of the Abū Bekr Mazal mosque (15th century) [14].

It is worth noting that these decorative motifs were probably brought to Tunisia through Egypt in the 15th century. This technique was widely used in the monuments during the following centuries, such as the *zāwiya* of Sidi Qāsim al-Zalījī (end of the 15th century), and even more so in the Ottoman era in the Medina of Tunis. Among the numerous examples of this last period, Dar Abū Zayane (15th – 16th century), The Palace of Dey 'Othman (16th-17th century), the Mausoleums of Sidi Yusef and Hammuda Pasha (17th century), *Dar al-Mrabet* (17th century) and *Dar al-Bey* (18th century) [15], should be mentioned.

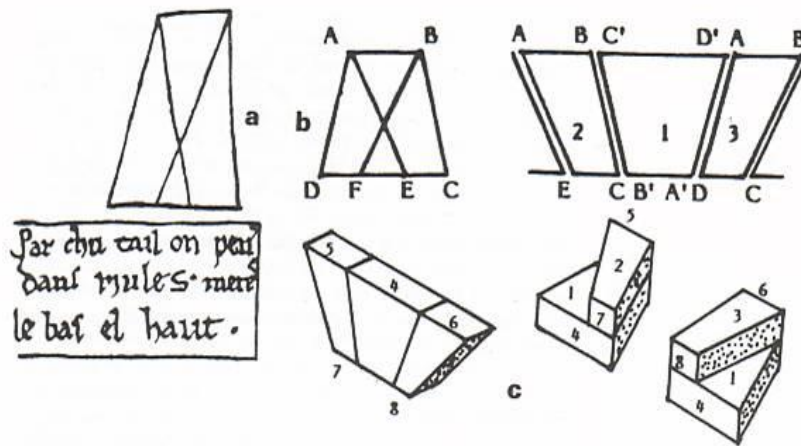


Fig. 4: The working phases of the radial segments according to the architect Villard de Honnecourt.



Fig. 5: Tunis, ablution room, facade of the south side of the peristyle.

It is worth reiterating the Andalusian influence. This influence took root in *Ifriqiya* during the first influx of emigrants who took refuge in *Ifriqiya* starting from the 8th century. This is also confirmed by the famous historian of that time, Ibn Khaldūn: "The arts develop admirably albeit with less momentum than in Spain. In addition, the influence of Egypt is particularly fruitful. The two countries are not distant and Tunisian travellers visit Egypt every year. Sometimes they live there for some period of time making artistic objects and sharing technical knowledge. For this reason Tunis has become as educated as Cairo, and Spain itself, thanks to the Andalusian refugees of the 7th and 8th centuries [16]." Moreover, the good relations between the Hafsids sultans and the Mamluk rulers of Egypt contributed to the spreading of this artistic style during the 15th century. All of this was possible thanks to the continuous exchange of artisans between the two countries as can be seen from inscriptions written, by Egyptian craftsmen, during particular public works [17].

In conclusion, it can be stated that the Hafsids era was characterised by a simple but highly creative architectural output thanks to which diverse Mediterranean decorative features were brought together. On the one hand, the Hafsids repertoire remained linked to the artistic and architectural elements which developed in *Ifriqiya* such as the ancient Punic, Roman and Byzantine ones as well as the Islamic Aghlabid, Fatimid and Zirid ones; on the other hand, it was influenced by diverse trends coming from Andalusia, Morocco and even Mamluk Egypt.

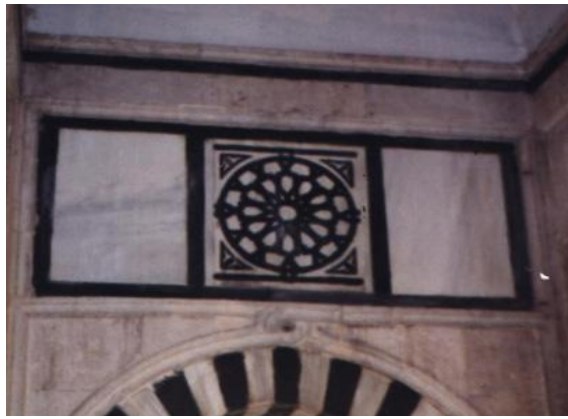


Fig. 6: Tunis, ablution room, main hall, inlaid panel.



Fig. 7: Tunis, ablution room, medallion on the arched lintels of the peristyle.



Fig. 8: Tunis, ablution room, snake design carved on the upright arch of the peristyle.



Fig. 9: Tunis, ablution room, Hispano-Moorish capitals.

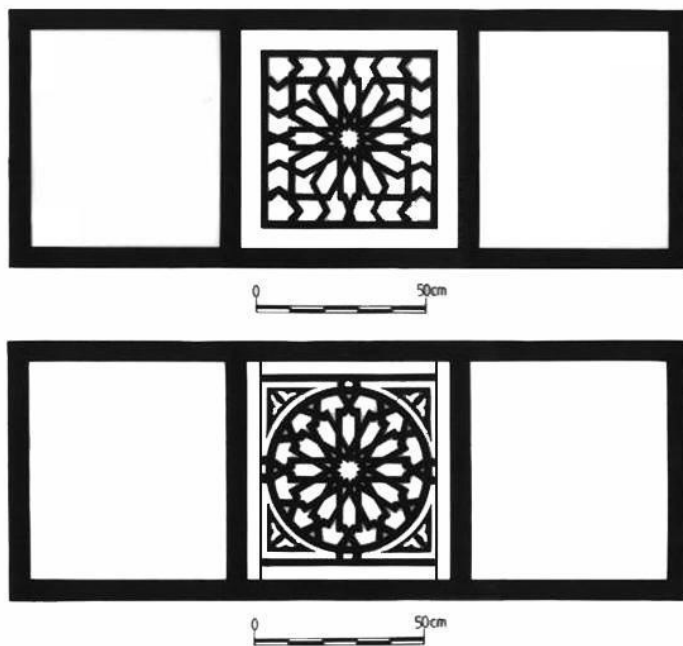


Fig. 10: Tunis, ablution room, main hall, two-tone panels inlaid with stellar motifs.

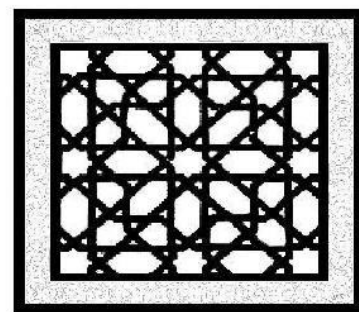


Fig. 11: Tunis, ablution room, facade of the principle corridor, marble panel with a geometric pattern.

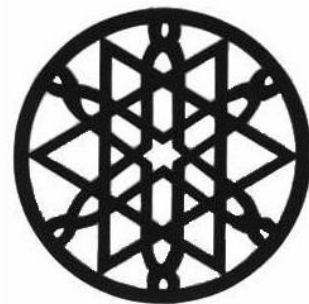


Fig. 12: Tunis, ablution room, drawing of a medallion.



Fig. 13: Tunis, ablution room, octagonal fountain.

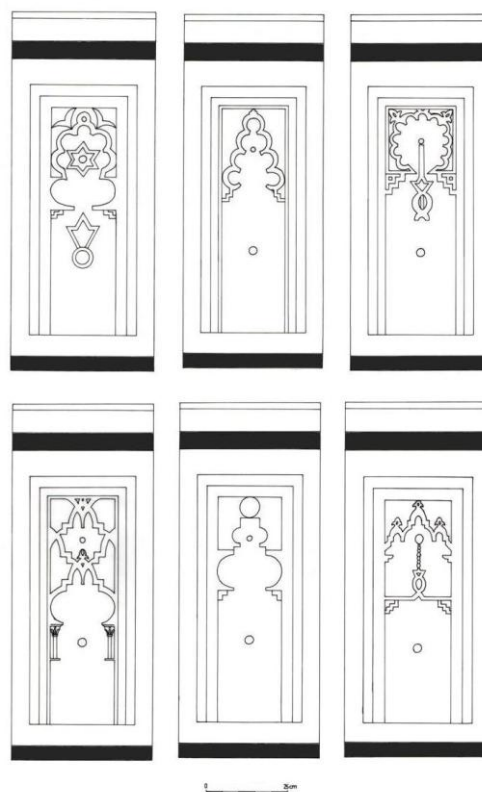


Fig. 14: Tunis, ablution room, white marble panel facade of the fountain.

Bibliographical References

- [1] IBN KHALDUN, Abderrahman. *Histoire des Berbères*, trad. De Slane, vol. II. Paris: Librairie orientaliste Paul Geuthner, 1999, p. 280-281.
- [2] BRUNSCHVIG, Robert. *La Berbérie Orientale sous les Hafsides des origines à la fin du XVème siècle*. Paris: Adrien Maisonneuve, 1940.
- [3] CHERIF, Mohamed Hédi. Introduction de la piastre espagnole (riyal) dans la Régence de Tunis au début du XVII^e siècle, *Les Cahiers de Tunisie*, n. 61-64, 1968, p. 45-55; SAADAOUI, Ahmed. *Tunis ville ottomane, trois siècles d'urbanisme et d'architecture*. Tunis: Centre de Publication Universitaire, 2001, p. 17-19.
- [4] See for Hafsid architecture DAOULATLI, Abdelaziz. *Tunis. Capitale des Hafsides*. Tunis : Alif, 2009; HADDA, Lamia. *Il decoro architettonico hafside: materiali per una storia dell'arte in Ifriqiya XIII-XVI secolo*. Napoli: Artemisia Comunicazione, 2004, (in arabo).
- [5] ZARKASHĪ, Muhammad ibn Ibrahim. *Tārikh al-dawlatayn al-Muwahidiyya wal-Hafsiya*, ed. H. Yakoubi. Tunisi: Al-Maktabah Al-'Atiqah, 1998, p. 235.
- [6] REVAULT, Jacques. Deux mid'as tunisoises, *Revue de l'Occident Musulman et de la Méditerranée*, n. 13-14, 2^e semestre 1973, p. 275-290; DAOULATLI, Abdelaziz. *Op. cit.*, p. 118-119.
- [7] BECHMANN, Roland. *Villard de Honnecourt. La pensée technique au XIIIe siècle et sa communication*. Paris: Picard, 1993, p. 202-205.
- [8] PAVÓN MALDONADO, Basilio. *El arte hispano-musulmán en su decoración geometrica (una teoría para un estilo)*. Madrid: Agencia española de cooperación internacional, 1989, p. 187-206.
- [9] DAOULATLI, Abdelaziz. *Op. cit.*, p. 121-125; REVAULT, Jacques. *L'habitation tunisoise: Pierre, marbre et fer dans la construction et le décor*. Paris: Centre National de la recherche

scientifique, 1978, p. 266-273; HADDA, Lamia. *Nella Tunisia Medievale. Architettura e decorazione islamica (IX-XVI secolo)*. Napoli: Liguori editore, 2008, p. 134-142, fig. 24-27.

[10] REVAULT, Jacques. *L'habitation tunisoise...*, cit., p. 241-242, pl. LXI-LXII; HADDA, Lamia. Le forme decorative in Ifriqiya tra XIII e XVI secolo. In COPPOLA, Giovanni. D'ANGELO, Edoardo. PAONE, Rosario (a cura di). *Mezzogiorno & Mediterraneo. Territori, strutture, relazioni tra Antichità e Medioevo*. Atti del Convegno internazionale, Napoli 9-11 giugno 2005. Napoli: Artemisia Comunicazione, 2006, p. 104-114, in part. p. 102, 104.

[11] REVAULT, Jacques. *L'habitation tunisoise...*, cit., p. 242-249, pl. LXIII-LXIV; ID. *Palais et demeures de Tunis* (XVI-XVII siècles). Paris: Centre National de la recherche scientifique, 1980, p. 80-81; SAADAOUI, Ahmed. *Op. cit.*, p. 330-331, fig. 19, 25-26.

[12] IBN AS-ŠAMMA'. *Al-Adella al-beynā an-nūranīa fi mafākhīr ad-dawla al-Hafsiyya*, ed. O. al-Ka'ak. Tunisi: ad-Dar al-'Arabiya II-kitab, 1936, p. 195.

[13] CARBONI, Stefano. TONGHINI, Cristina. *La Siria e l'Egitto nei periodi ayyubide dal 564/1169 al 658/1260 e mamelucco dal 648/1250 al 923/1517*. In CURATOLA, Giovanni. *Eredità dell'Islam, arte islamica in Italia*. Catalogo della mostra, Venezia, Palazzo ducale 30 ottobre 1993-30 aprile 1994. Milano: Silvana Editoriale, 1993, p. 275-289; HILLENBRAND, Robert. *Islamic Art and Architecture*, London: Thames and Hudson, 1999, pp. 138-166.

[14] BOURGOIN, Jules. *Précis de l'art arabe et matériaux pour servir à l'histoire, à la théorie et à la technique des arts de l'Orient musulman*. 2^a ed. Paris: Hachette Bnf, 2012, p. 15-17, pl. 41-45.

[15] REVAULT, Jacques. *L'habitation tunisoise...*, cit., p. 231-273.

[16] IBN KHALDUN, Abderrahman. *Discours sur l'Histoire universelle, Al-Muqaddima (Prolégomènes)*, trad. V. Monteil. Arles: Actes Sud, 2002, p. 633.

[17] AOUDI-ADOUNI, RAJA. Naqā'ish tithkēriyya Hafsiyya min madinat Tūnis. In M.H. FANTAR, M'hamed Hassine. KHADDAR-ZANGAR, Saloua (sous la direction de). *Mélanges d'archéologie, d'épigraphie et d'histoire, offerts à Slimane Mustapha Zbiss*. Tunis: Alpha Editions, 2001, p. 91-92.